

Public Information Brochure

Water Resources Development

Winnepesaukee River Basin

New Hampshire

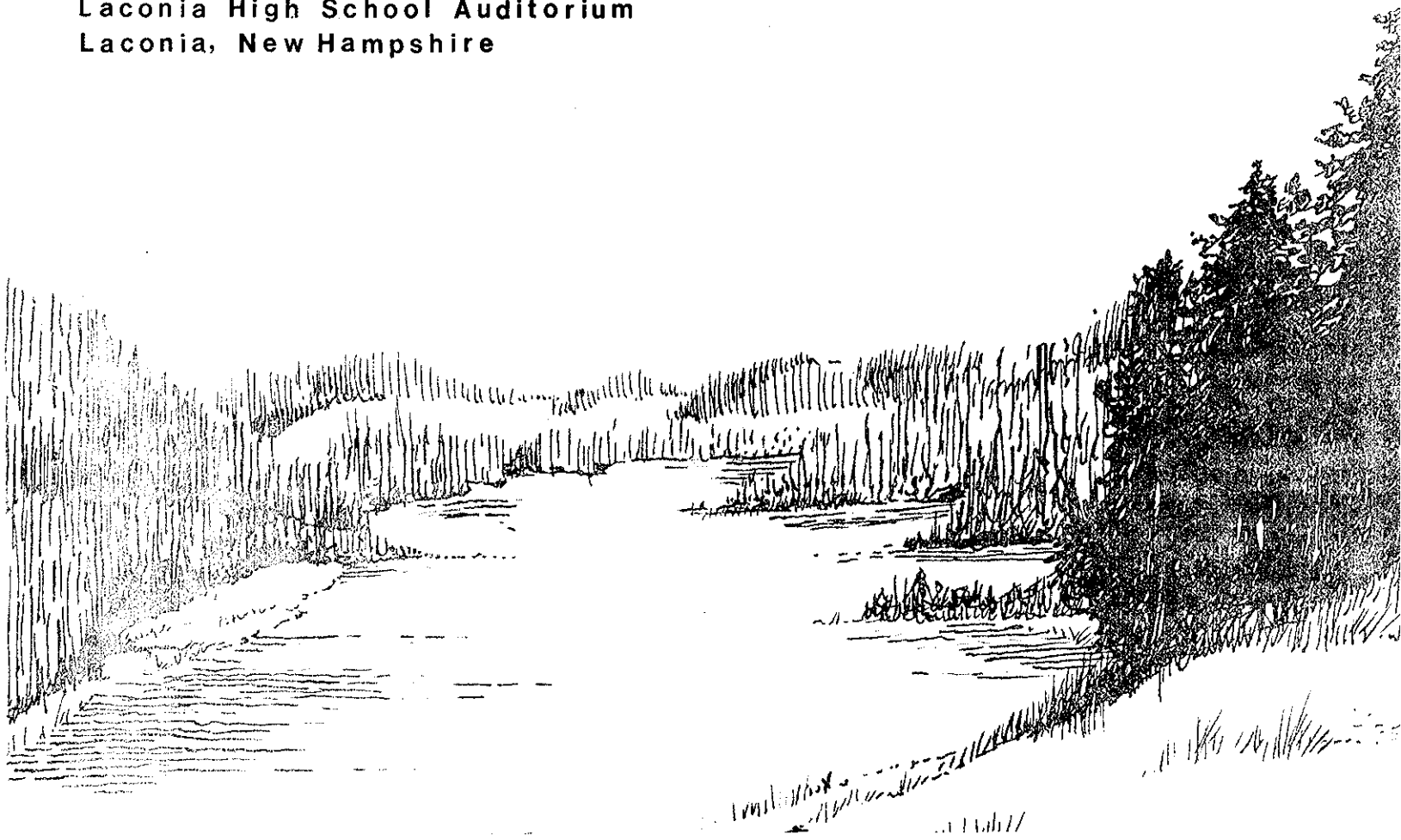
Prepared For:

a Public Meeting

Thursday November 15, 1979

Laconia High School Auditorium

Laconia, New Hampshire



The New England Division, U.S. Army Corps of Engineers, at the request of state and local officials, is studying the feasibility of providing flood control and developing other water resources in the Winnepesaukee River Basin.

The study will investigate the feasibility of controlling floodwaters from Lake Winnepesaukee and Paugus Bay. Improvement of conditions downstream to permit passage of higher streamflows, and methods of maintaining constant lake levels for recreational purposes along with other water resource problems and needs, will be studied in detail.

The brochure, describes the study area, known water resource problems and needs as well as the study procedure. It is intended to be an informative supplement to the public meeting of November 15, 1979.

If you are unable to attend that meeting, we hope you will fill out and return the postage paid form included in this brochure. If you attend, please hand in the form to the receptionist.

Copies of this brochure will also be available at the meeting or may be obtained by writing:

Department of the Army
New England Division
Corps of Engineers
Attn: NEDPL-PF
424 Trapelo Road
Waltham, MA 02154

An immediate and critical need of the Winnepesaukee River Basin is to control the flood waters caused by major storms and by seasonal high water...

THE STUDY AREA

The Winnepesaukee River Basin in north-central New Hampshire is approximately 40 miles long and 35 miles wide. The watershed is essentially a rough wooded plateau, which is mountainous in the northern part in Carroll County and generally hilly in the southern section, in Belknap and Merrimack Counties, with farmlands concentrated in valleys or on smooth ridges.

The Winnepesaukee River rises at The Weirs, (the westernmost part of Lake Winnepesaukee) and flows south-westerly for approximately 23 miles to the point where it joins the Pemigewasset River to form the Merrimack River in the City of Franklin. The Winnepesaukee River is the only outlet from Lake Winnepesaukee.

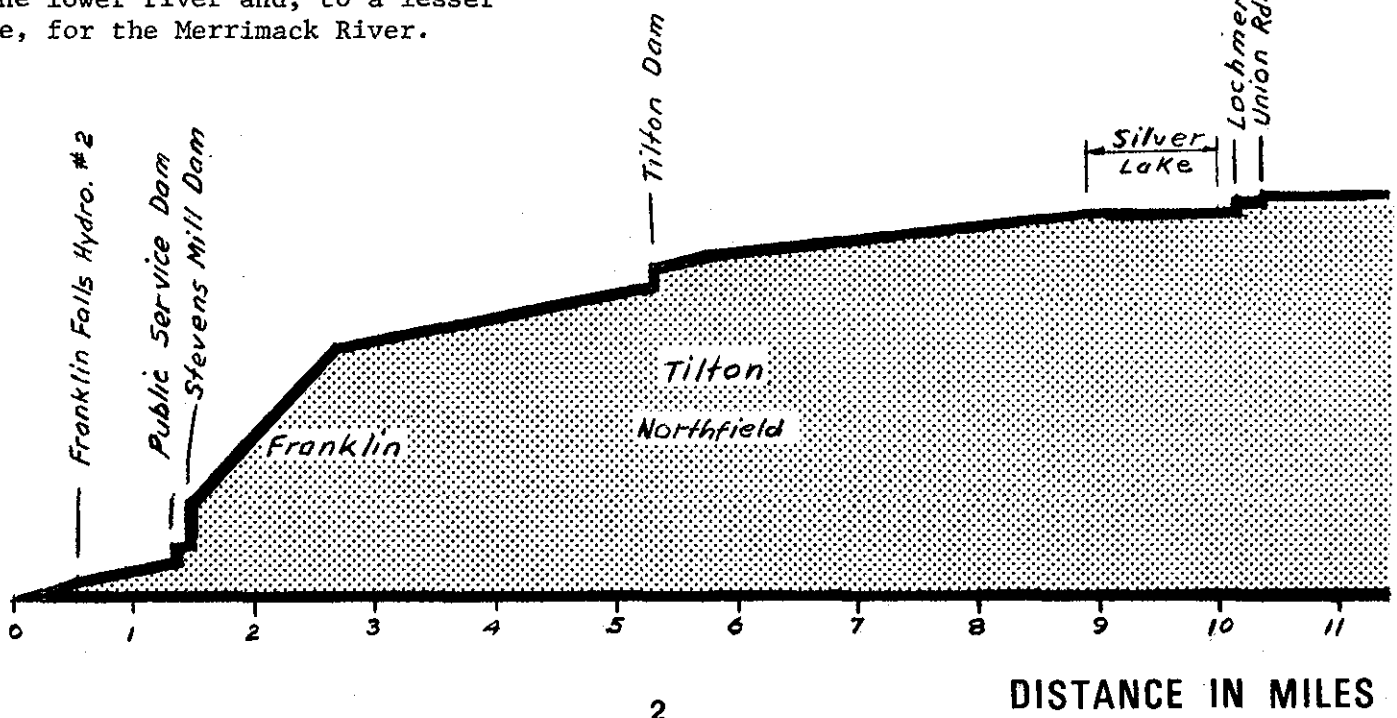
Lake Winnepesaukee is the largest freshwater body in New Hampshire, its shoreline including the shores of the major islands is approximately 210 miles. With approximately 75 percent of the total Winnepesaukee River drainage area contributing to Lake Winnepesaukee, the lake, in effect, is a natural flood control reservoir for the lower river and, to a lesser degree, for the Merrimack River.

Industrial and commercial establishments cluster along the river while summer and permanent residences and developments occupy much of the shoreline of the lakes.

The study area encompasses all or portions of 20 New Hampshire cities and towns and has sustained a constant moderate growth for several decades. The basin population fluctuates dramatically from season to season because of its attraction as a summer and winter resort area.

The economy of the study area is mainly dependent on recreation and tourism. The region features year-round residences, summer homes, tourist accommodations and establishments catering to summer and winter visitors.

The middle and lower basin contains the area's industrial activity. Manufacturing is the single largest employment sector throughout Belknap, Merrimack and Strafford counties, but here also tourism employs thousands in retail outlets, gift and souvenir shops, lodgings and recreation and amusement centers.



Severe constrictions within the Winnepesaukee River prevents lake level control for both recreational and flood control purposes

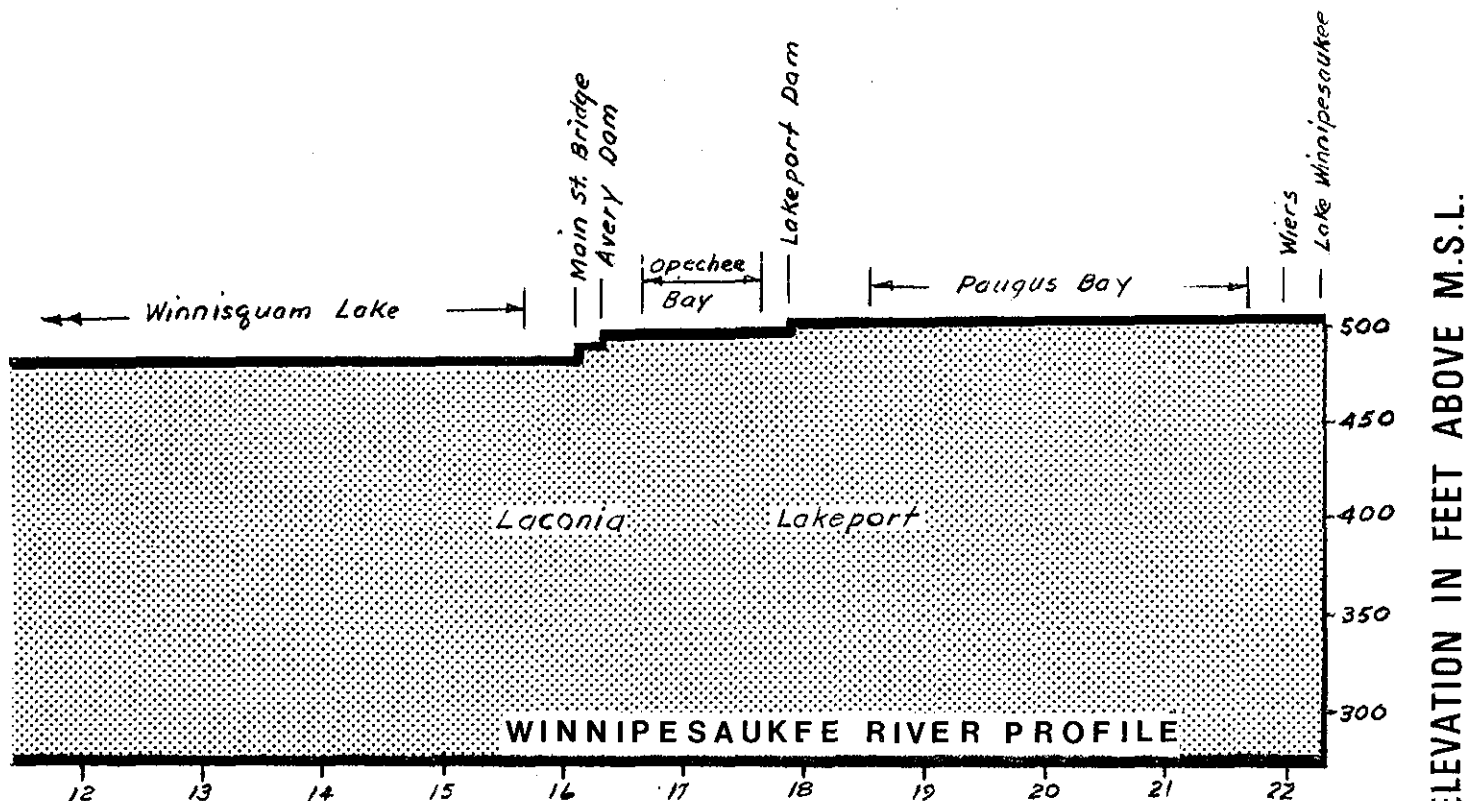
WATER RESOURCES PROBLEMS AND NEEDS

The present critical need in the Winnepesaukee River Basin is for control of floodwaters caused by major storms and by seasonal high water, caused mainly by fast snowmelt on frozen ground. The problem is further aggravated by the increases in new developments, such as buildings, shopping areas and parking lots around the lakes and along the river which increase runoff above natural stages. Greater volumes of runoff in smaller areas cause levels of the lakes and river to rise rapidly flooding along the periphery of the lakes and overtopping river banks. Relief at the upstream lake can only be obtained by releasing flows into the Winnepesaukee River. However, the increase in discharges results in flows that exceed the channel capacity or are obstructed and cause flooding downstream.

To identify the flood problems it is helpful to trace the river from Lake Winnepesaukee through Franklin. A profile of the river at the bottom of this page may be followed along with the description to locate key areas.

Flows and lake levels on Winnepesaukee, Opechee, and Winnisquam Lakes are controlled by structures owned and operated by the New Hampshire Water Resources Board.

Lakeport Dam has sufficient capacity to control Lake Winnepesaukee levels for minor flood conditions, however, the railroad bridge and the footbridge just upstream of the dam prevent a quick response in a flood condition. These restrictions leave the lake levels higher and limit flow out of the dam.



Avery Dam, in Laconia, is the control structure for Opechee Bay. The New Hampshire Water Resources Board recently improved the capacity of the dam. Even with this added capacity, flow between Lakeport and Avery Dams is limited by Messer Street and Church Street and the railroad bridges. The river between the dams has filled in with sand over the years, thereby limiting the flow-carrying capacity. As in the case of Lakeport Dam, downstream constrictions to flow prevent the State from operating their dams to the fullest extent for flood control.

Downstream of Avery Dam the new Main Street Bridge and, to a lesser extent, other bridges limit the flow. Large deposits of sand and other debris in the channel in this reach severely limit the river's capacity.

A similar situation occurs between Avery Dam and Lochmere Dam which includes Winnisquam Lake. In this reach, the Union Road Bridge, just upstream of Lochmere Dam, severely limits the efficiency of the dam during even minor flood events. The effect of the Union Road Bridge can be felt as far upstream as Avery Dam.

Lochmere Dam is the last control structure downstream of Lake Winnepesaukee which is owned and operated by the New Hampshire Water Resources Board. Downstream of this dam the river enters Silver Lake. At present there is no manmade structure for controlling lake levels and flows through the lake. Large fluctuations in lake levels are a common problem to recreation interests and pose a constant threat of flooding to lake side residents. Downstream from Silver Lake, the river flows under several highway bridges and two railroad trestles within the towns of Tilton and Northfield. The railroad trestle in the middle of Tilton is an obstruction to the flow. Immediately downstream of this trestle is the Tilton dam maintained by the town as a scenic pool, and as a water supply

for industry and fire protection. This timber dam is in need of repair.

The river continues through Franklin, passing several railroad trestles and highway bridges. In downstream Franklin, it passes over the last three dams on the river. The upper dam owned by the Steven Mills is utilized for the generation of electricity. Immediately downstream is the former Public Service Company timber dam, the life expectancy of which is unknown. Just downstream of the Daniell Bridge on Central Street the river passes over the last dam, Franklin Falls Hydro Dam No. 2, owned by Hydro Realty Corporation and operated by the Franklin Falls Hydro Electric Company. This rebuilt dam is being operated for power generation. Continuing downstream, the Winnepesaukee River combines with the Pemigewasset River to form the Merrimack River. Severe constrictions within the Winnepesaukee River prevent lake level control for both recreational and flood control purposes.

Historic floods are described on page 7 of this brochure. The Corps, when investigating flooding problems in developed areas, seeks solutions to serious floods such as the 100-year or the Standard Project Flood (see page 6 for definitions of flood terms). These infrequent floods can cause heavy loss of property and damages to structures and utilities and pose a serious threat to life and safety.

In addition to flood control needs are the needs of recreation, a major industry. The lake and connecting waterways in the Winnepesaukee Basin are attracting increasing numbers of people for recreational purposes and an accelerated growth rate is anticipated. The large number of summer homes, commercial establishments and recreational facilities require as constant a water level as possible in all lakes along the river. Other water resources problems, needs, and opportunities recommended by the public may also be included in the study.

It is essential that all potential problems, needs and desires of the communities be identified now to insure early consideration during the planning process.

The Corps recognizes the extensive programs by the state in areas of water quality and water supply; considerable improvement has already been made in these areas. The Corps will insure that any proposed improvements are properly coordinated with the state's on-going water quality and water supply goals and objectives.

THE STUDY PROCESS

Investigation into water resources problems and needs will utilize a three stage process. The study is now in Stage 1 which concentrates on problem identification; it is essential that we be aware of all potential problems, needs and desires of the community so that we can insure early consideration during the planning process. Study objectives and priorities will remain open for refinement and modification during each stage. The results of this first stage will be presented in a Reconnaissance Report which will set forth the justification for continuing the study, and establish a program for managing the rest of the study. The Reconnaissance Report is scheduled for publication within a few months. Once approved by higher authority, the report will be circulated to interested individuals and agencies.

During Stage 2, which should start in early 1980, evaluations of the engineering, economic and environmental aspects of all potential alternative solutions will be studied. During plan formulation, the Corps will follow two different approaches to solving flood problems in the Winnepesaukee River Basin. A structural approach may involve channel enlargement and removal of restrictive bridges or old dams to increase the capacity of the river or, possibly, levees and walls to confine floodwaters. The nonstructural approach may involve little or no construction activity in the river. This latter

approach relies on measures such as flood proofing existing structures in the flood plain or changes to the operation of existing water control structures. During the evaluation of alternatives, workshops will be conducted to inform the public of each alternative being considered. A public meeting late in Stage 2 will display all alternatives.

In Stage 3, alternatives will be further refined to obtain a reasonable selection of plausible plans. A public meeting will be held to present a selected plan and to hear the public's view on the plan and alternatives.

The selected plan and alternatives investigated will be presented in a feasibility report and Environmental Impact Statement. This report will include a recommendation for plan implementation if there is justification.

In preparing to investigate flood control measures the Corps developed a computer model of the Winnepesaukee River from its mouth in Franklin to the Lakeport Dam to enable engineers to study various schemes of lake level control and proposed changes in the river channel to reduce flood levels and improve recreation. A comprehensive flood damage survey is nearing completion and this survey will provide economists with data for analyzing the feasibility of various solutions and assessing the economic impacts of floods.

IMPACTS

Impacts on the study area, from alternative solutions to the problems, will be assessed throughout the study. In order to report to the public and to Congress on the feasibility of providing improvements in the Winnepesaukee river basin, the Corps will consider the impact of each proposal on:

Throughout the study , an open planning process will be pursued points of view may be freely expressed.

National Economic Development: involving the likelihood that the flood protection undertaken would maintain or increase the value of our nation's output of goods and services and improve economic efficiency.

Regional Development: including the expansion of business and industry as a result of the flood protection provided, enhanced recreation, and social development.

Environmental Quality: such as the preservation of natural, cultural and scenic areas; enhancement of recreational opportunities; and, in general, the creation and maintenance of conditions under which man and nature can exist in productive harmony; and

Social Well-Being: of the greatest possible number of people in terms of real income, security of life, health and safety, education, cultural and recreational opportunities, and emergency preparedness.

The public's opinions of the social, economic and environmental and impacts is important for the evaluation of solutions.

NEED FOR PUBLIC INVOLVEMENT

It is estimated that the study will require three years to complete. Problems and needs of the study area must first be identified, then alternative measures developed to deal with them. The response form included in this brochure, and the public meeting are two ways the Corps will identify problems and needs.

To assure that the plans adequately address public desires and needs the Corps of Engineers diligently seeks the views and suggestions from those who have special expertise and whose interests would be affected. Close coordination with Federal, State and local agencies will assure compliance

with their programs and plans within the study area.

An open planning process will be pursued wherein all points of view may be freely expressed, through workshops and public meetings, for the duration of the study.

THE DIFFERENT KINDS OF FLOODS

Floods come in all types and sizes, ranging from minor street and basement flooding to the worst disaster that could ever be reasonably expected to occur. The Corps of Engineers has established some flooding definitions that are helpful in talking about and dealing with flood problems.

THE 10-YEAR FLOOD. This is a flood event that could occur every ten years or so, and thus has a 10% probability of occurring in any given year.

THE 100-YEAR FLOOD. This is a flood event that could occur about once in every 100 years, and thus has a 1% probability of occurring in any given year. For flood insurance purposes, this is also known as the "Base Flood."

THE STANDARD PROJECT FLOOD (SPF). This describes the worst flood that could be reasonably expected to occur. It is greater than the 100-year flood.

In understanding floods, it is important to bear in mind that, just because a flood has an average likelihood of occurring once in 10 or once in 100 years, this doesn't mean it couldn't happen twice or more in the same year. It's just that the probability of its happening with that kind of increased frequency is small.

Flooding terms are referred to frequently in this brochure. If you can't remember a given term just refer to this guide.

FLOOD HISTORY IN THE WINNIPESAUKEE RIVER BASIN

The Winnepesaukee River Basin sustained three serious floods in the last 43 years. In March 1936, Lake Winnepesaukee rose from three feet below to about seventeen inches above its full level. The resulting flooding along the Winnepesaukee River damaged industrial and commercial buildings, residential dwellings and inundated streets and highways in Laconia and Franklin. The flood threat in Franklin was partially alleviated with the construction by the Corps of Franklin Falls Dam on the Pemigewasset River. Flooding in the spring of 1953 was caused by a combination of heavy rains and melting snow producing high inflow to Lake Winnepesaukee which crested at 18 inches above full pool. The following spring the lake filled above full level. That crest of nearly 19 inches resulted from a series of storms that followed the filling of the lake by normal spring runoff. If the 1954 flood was repeated today, an estimated half million dollars in flood damages could be expected. In addition to major floods, less serious flooding caused by snowmelt and heavy rainfall has plagued the river basin repeatedly. Intense rain on 4 July 1973 raised lake level and caused damage to lakefront and riverfront properties.

FLOOD OF MARCH 1936



RIVER STREET, FRANKLIN, N.H.

STUDY AUTHORITY

Requests by State and local interests that the flood problems of the Winnepesaukee River Basin be reviewed resulted in a Resolution being adopted in 1970 by the Committee on Public Works of the U.S. House of Representatives. It states, in part:

"Resolved....that the Board of Engineers for Rivers and Harbors is hereby requested to review the reports of the Chief of Engineers on the Merrimack River, Massachusetts and New Hampshire, contained in the House document No. 689, 75th Congress, Third Session, and other pertinent reports, with specific reference to Winnepesaukee River, New Hampshire, with a view to determining the advisability of improvements in the interest of flood control and allied purposes."

THE PUBLIC MEETING

All interested parties are invited and urged to be present or represented at the public meeting, including representatives of Federal and non-Federal public agencies, interested or concerned citizens, property owners, and other interests. All parties will be afforded full opportunity to express their views and furnish specific data on matters pertinent to the study, including technical, economic, and environmental material.

Statements should be supported by factual information insofar as practicable, for example, by listing problem locations, description of flood damages incurred and the date of the event. Suggestions or ideas to prevent flooding or to improve the water resources in the area may be presented at the meeting.

Oral statements will be heard but, for accuracy of record, all important facts and statements should be submitted in writing and in duplicate. Written statements may be handed to the presiding officer at the meeting or may be mailed beforehand to the address on page 1. Statements so mailed should indicate that they are in response to this brochure. All statements, both oral and written, will become part of the official written record of this meeting and will be made available for public examination.

PLEASE BRING THIS BROCHURE TO THE PUBLIC MEETING.

THE PUBLIC MEETING WILL BE HELD

THURSDAY EVENING
NOVEMBER 15, 1979 at 7:30 P.M.
IN THE LACONIA H.S.
AUDITORIUM, LACONIA,
NEW HAMPSHIRE



**United States Army
Corps of Engineers**
...Serving the Army
...Serving the Nation

New England Division

